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fact that they are uniformly found in material after different methods of preservation, and especially by the fact that the segments can be seen in the fresh living embryos.

The entire number of segments in the brain region is given as fourteen, with a possible fifteenth represented in the median unpaired tip at the extreme front. Between these primitive segments and the cranial nerves the relations are not definitely ascertainable at present. A "tentative estimate of numerical relations" is as follows: I. First neuromere of fore-brain, olfactory. II. Second neuromere of fore-brain, optic. III. Third neuromere of fore-brain, possibly nerve to pineal sense-organ. IV. First neuromere of mid-brain, oculomotor. V. Second neuromere of mid-brain, trochlearis. VI. First neuromere of hind-brain, anterior root of trigeminus. VII. Second neuromere of hind-brain, main root of trigeminus. VIII. Third neuromere of hind-brain, no nerve root, in early stages. IX. Facialis. X. Auditory. XI. Glossopharyngeal. XII, XIII, XIV. Roots of vagus.

A summary of nine headings closes the first part of the paper. Abbreviated these are as follows: 1. The neuromeres are not artefacts. 2. "Neuromeric segmentation" appears "long before there are any segmental divisions of the mesoderm," and is therefore "more primitive than mesodermic segmentation." 3. The structure of the segments proves them to be characteristic cell groups and not mere "mechanical undulations." 4. The entire embryo is similarly segmented, passing thus through an arthrometric condition similar to that of arthropods and worms. 5. Eleven segments are clearly defined in front of the vagus region, or fourteen in all (nine in the hind-brain, two in the mid-brain and three in the fore-brain). 6. There is evidence to show that the spinal cord is being encroached upon by the brain, seven segments appearing first in the hind-brain, two more differentiating later. 7. The segmentation is clearest in the epiblast and least clear in the mesoblast. 8. The segments are related to cranial and spinal nerves and sense organs. 9. The neuromeres are greatly modified and early obliterated in front, persist until after the development of the cranial nerves in the hind-brain region, and then they fade away.

The second part of the paper is devoted to a discussion of the sense organs, by which the author's former position is strengthened. It is especially useful as a presentation of the evidence which indicates that the sense organs of the head region arise in a serially homologous manner, from the nasal pits and optic vesicles to the auditory and lateral line organs.

C. F. H.

Notes of a Case of Dual Brain Action. LEWIS C. BRUCE. Brain, LXIX, 1895, pp. 54-65.

The peculiar interest attaching to this case relates to the definite evidence presented to prove that the right and left cerebral hemispheres controlled the individual in different and characteristic ways. The subject is a Welsh sailor, insane fifteen years, noted for exhibiting two distinct states. These the author distinguishes briefly as the "English" and "Welsh" state. In the Welsh state he was "absolutely demented," and did not understand a word that was said to him, but frequently jabbered incoherent Welsh. From this state he passed quite suddenly into the English state, in which "he was restless, talkative, destructive and mischievous," and expresses himself in English, and understands what is said to him. In the Welsh state he "used the left hand exclusively" and

wrote "mirror script;" in the English state he was right-handed, and wrote from left to right in the ordinary way. In passing from one to the other he was often ambidextrous and spoke both Welsh and English. In the English state he is fairly intelligent, draws pictures of ships and tells stories of his former life. His memory is a complete blank for all events that have occurred to him during the Welsh state, while he remembers clearly things that happened during previous English states. The right and left-handedness make this one of the clearest cases of dual brain action on record. The pulse was different in the two states, full with high tension in the English, and weak with lower tension during the Welsh state.

C. F. H.

Mental Stupor as a Pathological Entity. JAMES R. WHITWELL. Brain, LXIX, 1895. Pp. 67-73.

The author's observations on a group of cases in which "mental and nervous lethargy and torpor," . . . . and "no sign of originating mental power" are characteristic features, tend to support the theory that the condition is caused by deficient development of the vascular system. He finds in general a disproportionately small heart or aorta or basal cerebral vessels, one or all three, which suggests that the vascular system has "ceased developing at the stage of evolution or about puberty or adolescence." Either this lack of proportion between vascular and cerebral systems is present or the stupor is intermittent, "caused by or associated with temporary spasm of the peripheral vessels during the period of mental stupor, this spasm relaxing during the period of lucidity." In the general thesis this line of reasoning resembles a theory now practically abandoned, viz., that early anchylosis of the skull sutures prevents development of the brain.

C. F. H.

On the Accelerator and Inhibitory Nerves to the Crab's Heart. F. S. CONANT and H. L. CLARK. Journal of Experimental Medicine, Vol. I, pp. 340-46. Baltimore, 1896.

It is somewhat surprising to find the nervous control of the heart in crustacea practically as complete as in the vertebrates. The crab experimented upon was the common edible crab, *Callinectes hastatus*, and, while others have demonstrated accelerator and inhibitory effects on the stimulation of various nerves in the crustacean, the exact anatomical relations, together with the physiological function of each nerve, have not been clearly made out by previous observers. All the cardiac nerves arise from the anterior part of the thoracic ganglion. The most anterior pair of heart nerves are inhibitory. Behind these, opposite the origin of the nerves to the third maxillipeds and first ambulatory leg, arise two pairs of accelerator nerves. Besides these, as in the higher animals, a ganglionic plexus is present in the pericardial wall. This nervous supply is able, with the heart isolated, to carry on the rhythmical beat normally, as in higher vertebrates. Stimulation of the cerebral ganglia invariably caused inhibition. Actual tracings were obtained by delicate tambours, which give the main results with graphic clearness.

C. F. H.

A Case of Circumscribed Unilateral and Elective Sensory Paralysis. LEWELLYN F. BAKER. Journal of Experimental Medicine, Vol. I, pp. 348-60.

Owing probably to a cervical rib pressing upon some of the posterior fibres of the brachial plexus, cutaneous sensibility is deficient